

**AMENDMENTS TO THE CLAIMS**

1. (Currently amended) A method for monitoring continual range queries against events, said method comprising:

retrieving from a memory, one or more range queries;

decomposing each range query into one or more predefined virtual constructs;

building a query index;

receiving, via an input port, data associated with one or more events; and

using said query index to match an event with said range queries.

2. (Original) The method of claim 1, said building of a query index further comprising:

storing an identification of said query with identification lists associated with said virtual constructs.

3. (Original) The method of claim 1, said building of a query index further comprising:

predefining a set of virtual constructs for each point being monitored.

4. (Original) The method of claim 1, said matching of an event with said range queries further comprising:

finding all the virtual constructs that cover said event.

5. (Original) The method of claim 1, said decomposing of a range query further comprising:

initializing a working rectangle to be said range query;  
repeatedly cutting a strip rectangle from said working rectangle; and  
decomposing said strip rectangle with one or more of said virtual constructs.

6. (Previously presented) The method of claim 4, wherein a size of the set of covering virtual constructs of an event is constant for all the event points.

7. (Original) The method of claim 4, wherein gaps between corresponding different covering virtual constructs of all event points are identical.

8. (Previously presented) The method of claim 4, said finding of all covering virtual constructs of an event comprising:

pre-computing of a difference table;  
computing an identification of a pivot virtual construct; and  
adding said identification of pivot virtual construct to each of the elements stored in said difference table.

9. (Currently amended) A method of providing a service of monitoring events or conditions, said method comprising ~~at least one of the following~~:

providing a service that monitors events against interests of a customer, said service monitoring said events by decomposing continual range queries related to said customer interests with one or predefined virtual constructs, building a query index, and using said query index to match an event with said range queries;

maintaining one or more customer interests expressed as continual range queries for the service that monitors events; and

notifying a subset of said customers whose interests match an event.

10. (Currently amended) A system for monitoring continual range queries against events, said system comprising a processor on a computer, as executing:

a decomposing module that decomposes each range query into one or more predefined virtual constructs;

a query index construction module; and

an event matching module that uses said query index to match an event with said range queries.

11. (Original) The system of claim 10, further comprising:

at least one sensor to detect occurrence of events.

12. (Original) The system of claim 10, further comprising:

at least one client input station to permit a client to provide an input query.

13. (Original) The system of claim 10, further comprising:

at least one client receiver to permit a client to be notified of occurrence of an event of interest.

14. (Original) An apparatus for monitoring continual range queries against events, said apparatus comprising one of:

a query monitor that includes:

a decomposing module that decomposes each range query into one or more predefined virtual constructs;

a query index construction module; and

an event matching module that uses said query index to match an event with said range queries;

a sensor to detect occurrence of events and provides said occurrence of events into said query monitor;

a client receiver to permit a client to be notified of occurrence of an event of interest to said client.

15. (Currently amended) A non-transitory, signal-bearing storage medium tangibly embodying a program of machine-readable instructions executable by a digital processing apparatus to perform a method for monitoring continual range queries against events, said method comprising:

decomposing each range query into one or more predefined virtual constructs;

building a query index; and

using said query index to match an event with said range queries.

16. (Previously presented) The method of claim 1, wherein said event is monitored by scanning points in an event space having at least two dimensions, and said predefined virtual constructs comprise rectangular objects in said event space.

17. (Previously presented) The method of claim 16, wherein dimensional ratios of said predefined virtual constructs are based on powers of 2 relative to a dimension of said event space.

18. (Previously presented) The method of claim 1, wherein each said predefined virtual construct is identified as based on a location of a corner of said virtual construct in a monitored region of said event space and at least two dimensions of said virtual construct.

19. (Previously presented) The method of claim 18, wherein an identification of each said predefined virtual construct is calculated to be an integer, the calculations for said integer being based at least in part on said location and said at least two dimensions.

20. (Previously presented) The method of claim 1, wherein said decomposing each range to determine said one or more predefined virtual constructs comprises generating a set of working rectangles in an event space that become progressively smaller in size.